DETAILED ACTION

Examiner's Amendment

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Glenn Law (Reg # 34, 371) on 11/20/09.

This application has been amended:

IN THE CLAIMS:

13. (Currently Amended) A similar-pattern searching method, employed for clinical diagnosis or treatment ~~in a medical support system~~, of searching a target pattern having a high similarity to a pattern of a test sample from a group of patterns including a plurality of patterns, the similar-pattern searching method comprising:

in an apparatus for clinical diagnosis or treatment

generating a class map by selecting model parameters that characterize a plurality of component fractions included in each pattern in the group and by clustering the patterns based on selected model parameters, the model parameters including a number, an average, a variance and a density for the plurality of component fractions;

storing the class map generated at the generating step into a storage unit; and

selecting a class similar to a component fraction included in the target pattern from the class map in the storage unit, wherein the selecting includes detecting the class based on similarity distance from a target class, which is equal to or smaller than a predetermined threshold, and determining the pattern included in the class as a pattern having a high similarity to the target pattern.

16. (Currently Amended) A similar-pattern searching method, employed for clinical diagnosis or treatment ~~in a medical support system~~, of searching a leukocyte particle size pattern having a high similarity to a target leukocyte particle size pattern of a test sample from a group of patterns including a plurality of leukocyte particle size patterns, each of the leukocyte particle size patterns including a plurality of cellular component fractions, the similar-pattern searching method comprising:

in an apparatus for clinical diagnosis or treatment

clustering the leukocyte particle size patterns, which are obtained by measurement, in the group while applying a self-organizing map to the leukocyte particle size patterns to thereby generate a primary class map;

executing an EM algorithm for each leukocyte particle size pattern included in the primary class map by using predetermined initial values to thereby determine first-mixture-distribution model parameters including number of cellular components contained in each leukocyte particle size pattern and an average, a variance, and a density of each cellular component;

executing an EM algorithm for each leukocyte particle size pattern in the group by using the first-mixture-distribution model parameters as initial values to thereby determine second mixture distribution model parameters including number of the cellular components contained in each leukocyte particle size pattern, and an average, a variance, and a density of each cellular component;

clustering the leukocyte particle size patterns in the group while applying the self-organizing map to the first mixture distribution model parameters to thereby generate a secondary class map;

calculating similarity distances between all combinations of the classes included in the secondary class map, and generating an inter-class distance master that includes a correspondence of each combination of the classes and the similarity distance for the combination;

storing the secondary class map and the inter-class distance master in a storage unit;

determining a target class belonging to each of cellular component fractions included in the target leukocyte particle size pattern from the secondary class map in the storage unit; and

detecting, as a similar class, a class from the inter-class distance master for which similarity distance from the target class is equal to or smaller than a predetermined threshold, and determining a leukocyte particle size pattern included in

the similar class as a pattern having a high similarity to the target leukocyte particle size pattern.

Response to Amendment

2. Applicant's amendment filed on 7/14/09 has been entered.

Claims 1-9 is canceled.

Claims 10 -18 are pending in the application.

Applicant has amended claims 13 and 16 to overcome 35 USC § 101 rejection. Therefore, the rejection under 101 has been withdrawn.

Response to Arguments

3. Applicant's arguments filed on 7/14/09 have been fully considered and persuasive (see page 10- 13, of the remarks filed on 7/14/09). The 101 rejection are withdrawn and all the pending claims 10- 18 are now allowed.

Information Disclosure Statement

4. The information disclosure statement (IDS) submitted on 5/22/06; 8/22/06 has been considered by the examiner.

Reasons For Allowance

5. The following is an examiner's statement of reasons for allowance:

Claims 10-18, are allowed. Renumbered as 1-9.

In response to applicant's amendment persuasive arguments (see page 10 - 13, of the remarks filed on 7/14/09). The prior art of record Hiromi Kataoka et al., is directed to a technique for clustering and 3D visualization of leukocyte scattergrams. Kataoka discloses creating a large database of leukocyte scattergrams, clarifying a characteristic pattern using a data mining technique, 3D visualization and similarity search functionality. However, creating a large database of leukocyte scattergrams is not identical to storing "a class map generated by selecting model parameters that characterize a plurality of component fractions included in each pattern in the group and by clustering the patterns based on selected model parameters, the model parameters including a number, an average, a variance and a density for the plurality of component fractions." Further, clarifying a characteristic pattern using a data mining technique, 3D visualization and similarity search functionality is not identical to selecting "a class similar to a component fraction included in the target pattern from the class map in the storage unit, wherein the similar-pattern searching unit that detects the class based on similarity distance from a target class, which is equal to or smaller than a predetermined threshold, and that determines the pattern included in the class as a pattern having a high similarity to the target pattern." Kataoka fails to disclose, teach or suggest each and every element of claim 10, 13 and 14. Heskes is directed to self organizing maps, vector quantization and mixture modeling. Generally, Heskes discusses self-organizing maps which are used for clustering and visualization of high-dimension data. The Office Action essentially sites the entire article as disclosing each element of independent claims 10 and 13.

However, a careful reading of Heskes will reveal that it does not disclose each and element of amended independent claims 10 and 13. For example, Heskes does not disclose storing "a class map generated by selecting model parameters that characterize a plurality of component fractions included in each pattern in the group and by clustering the patterns based on selected model parameters, the model parameters including a number, an average, a variance and a density for the plurality of component fractions." Further, Heskes does not identically disclose selecting "a class similar to a component fraction included in the target pattern from the class map in the storage unit, wherein the similar-pattern searching unit that detects the class based on similarity distance from a target class, which is equal to or smaller than a predetermined threshold, and that determines the pattern included in the class as a pattern having a high similarity to the target pattern", (as recited by claim 10 and 13),

The closest prior art to Hiromi Kataoka et al., and Nishikiori et al., (US. 6,246,786 B1) fails to teach or suggest, at least a primary clustering unit that clusters the leukocyte particle size patterns, which are obtained by measurement, in the group while applying a self-organizing map to the leukocyte particle size patterns to thereby generate a primary class map; a first-parameter determining unit that executes an EM algorithm for each leukocyte particle size pattern included in the primary class map by using predetermined initial values to thereby determine first-mixture-distribution model parameters including number of cellular components contained in each leukocyte particle size pattern and an average, a variance, and a density of each cellular

component; a second-parameter determining unit that executes an EM algorithm for each leukocyte particle size pattern in the group by using the first-mixture-distribution model parameters as initial values to thereby determine second mixture distribution model parameters including number of the cellular components contained in each leukocyte particle size pattern, and an average, a variance, and a density of each cellular component; a secondary clustering unit that clusters the leukocyte particle size patterns in the group while applying the self-organizing map to the first mixture distribution model parameters to thereby generate a secondary class map; an inter-class distance master generator that calculates similarity distances between all combinations of the classes included in the secondary class map, and that generates an inter- class distance master that includes a correspondence of each combination of the classes and the similarity distance for the combination; a storage unit that stores therein the secondary class map and the inter-class distance master; a class determining unit that determines a target class belonging to each of cellular component fractions included in the target leukocyte particle size pattern from the secondary class map in the storage unit; and a similar-pattern searching unit that detects, as a similar class, a class from the inter- class distance master for which similarity distance from the target class is equal to or smaller than a predetermined threshold, and that determines a leukocyte particle size pattern included in the similar class as a pattern having a high similarity to the target leukocyte particle size pattern (as recited in claim 15, 16,17 and 18), the prior art of record fails to teach either singularly or in combination, fails to anticipate or render the above limitations obvious. Claims 10-18 are allowed.

6. Any comments considered necessary by applicant must be submitted on later than the payment of the issue fee and to avoid processing delays should preferably accompany the issue fee. Such submissions should be clearly labeled, comments on statement of reasons for allowance.

Contact Information

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sheela C Chawan whose telephone number is. 571-272-7446. The examiner can normally be reached on Monday - Friday 8.30 am - 5.00 pm and every Wednesday work from home. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Sheela C Chawan/

11/20/09

Primary Examiner, Art Unit 2624.